



**Exploring the effect of AI Chatbots on Customer experience,  
Satisfaction and Advocacy: New Evidence from the Banking  
sector in Egypt**

**Heba Abdel Wahab**

**Assistant professor of Business Administration**

**Faculty of commerce and business administration, Future  
University in Egypt**

<https://orcid.org/0000-0001-9934-8987>

**E-mail: heba.abdelwahab@fue.edu.eg**

هبة عبد الوهاب

مدرس ادارة الاعمال

كلية التجارة و ادارة الاعمال- جامعة المستقبل

**Abstract**

As a result of digital transformation and intense competition, companies are facing a critical challenge in attracting and keeping customers. The new era customers desire to spend the least possible time in contacting the organization, and at the same time they need to reach the organization from any location and at any time. The use of chatbots has enabled organizations to face that challenge. This study aims to investigate the effect of the use of AI chatbots on customer experience, customer satisfaction that can lead to customer advocacy. The empirical analysis was handled by collecting data through an online survey from a sample of 335 customers of five banks in Egypt that have used chatbots to communicate with its customers. Results revealed that Chatbots reliability, responsiveness, interactivity, and usability have a significant positive effect on customer experience which in turn has a positive effect on customer satisfaction. Moreover, the findings revealed that Customer satisfaction has a significant effect on customer advocacy. This research makes a valuable contribution to the existing body of literature as it is one of few studies that have chosen the banking sector in Egypt to study the effect of the AI chatbots on customer experience, satisfaction, and advocacy. Especially with the implementation of the financial inclusion which aims to provide both individuals and enterprises with the necessary and reasonably priced financial products and services.

**Keywords:** AI chatbots, customer experience, customer satisfaction, customer advocacy, and Banking sector.

## 1. Introduction

Companies are continuously challenged to attract and keep clients as a result of digital innovations and increasing competition (Maroengsit, W. et al., 2019). The client nowadays desires to devote little time in contacting the organization, and hence wants to be allowed to contact the organization at any moment and from any place, no matter the time, location, or channel is (Suwono, L.V. and Sihombing, S.O., 2016). AI Chatbots are tools for responding to digitalization and improving customer experience (Ameen, N. et al., 2021) Providing extra channels of communication to organizations that increase the interaction with customers (Suwono, L.V. and Sihombing, S.O., 2016). AI chatbots are software programs that can carry on conversations with humans using actual language (Dale, R. ,2016). They are also examples of interactive systems that facilitate communication between humans and machines. Since 2016, both Microsoft and Facebook have released protocols for the incorporation of chatbots on their sites (Skjuve, M. et al.,2019; Adamopoulou, E. Moussiades, L. ,2020) which has led to an enormous rise in chatbots adoption and widespread use.

Artificial intelligence (AI) technology and machine learning now permit AI empowered chatbots to imitate human conduct and use conversational scenarios (Følstad, and Brandtzaeg, , 2020; Følstad, and Taylor, ,2021), leading to their usage in a wide variety of industries and applications such as marketing, medical care, educational institutions, support systems, etc. (Adamopoulou, and Moussiades, ,2020; Følstad and Brandtzaeg 2020). AI-enabled chatbots, however, are viewed as an exciting development for suppliers of services (Dale, R. ,2016) because they offer programmed interactive customer support (Følstad, and Brandtzaeg 2020). Online interaction is critical to improving consumer experience (McLean and Wilson 2016). A personalized strategy in digital interaction with customers is critical for the consumer and their retention (McLean and Wilson, 2016). Satisfaction is achieved through matching client expectations, as stated by Siswi and Wahyono, (2020)

Customer expectations as well as satisfaction can be achieved through enhancing the customer experience by responding proactively to a client's queries and complaints (Hallowell, R., 1996). This study aims to investigate the effect of AI chatbots quality dimensions such as: reliability, responsiveness, interactivity, and usability on online customer experience measured by intrinsic and extrinsic value and how the customer experience can positively affect the customer satisfaction that can lead to customer advocacy.

## 2. Literature review and hypothesis development:

### 2.1 Artificial intelligence Chatbots

Artificial Intelligence (AI) is the ability of machines like computers and robots to learn and act autonomously (Dirican, 2015). AI and automation advancements have been rapid, particularly in the last decade, and it is now employed in all sectors and transforming the way organizations operate. Although AI and automation have been around for a while, they are increasingly becoming part of our daily life now (Guo, 2015). Chatbots are digital service representatives powered by artificial intelligence that can communicate with consumers in spoken language (Sands et al., 2021). This ability to understand spoken language and engage in discussions enables chatbots to provide customer services and enhance customer experiences by reducing the effort required by consumers and permitting customers to allocate their time better (Mimoun et al., 2017). Customers, for example, can receive quick responses via chatbots without having to wait for a human employee (Rese et al., 2020). Chatbots, with their continual and immediate accessibility, enable enterprises to support clients in an affordable and effective way (McLean and Osei-Frimpong, 2019). Therefore, a growing number of businesses are integrating chatbots within their offering (Rese et al., 2020).

Chatbots are divided into two types based on their intended function. The most prevalent type of chatbot is the rule-based chatbot, whereas artificial intelligence chatbots or generative chatbots are more advanced (Suhel, S. F., 2020). Rule-based chatbots are trained to perform a certain function and can exchange brief conversations with their human counterparts. While generative chatbots may imitate human dialogue (Chen, H., et al, 2017), they are also expected to use AI and machine learning to produce wholly new responses and lines (Huang, D.H.; Chueh, H.E.,2021).

## 2.2 Online Customer experience

Superior customer experience development is now a top management goal. The concept of customer experience has been analyzed in a variety of commercial contexts, including marketing, services' sector, travel, and shopping (Bonnin 2006; Tsai 2005; Arnold et al. 2005; Quan and Wang 2004; Jones 1999). But with the rise of online activities, it has also been investigated in relation to the Internet (Rose S. et al. 2011).

Meyer & Schwager (2007) have given customer experience a definition as the personal and internal response a customer has to the interaction with an organization that occur through the purchase or use of a good or service, or through the bond created between the brand and the customer developed through referrals, reviews, and promotion. Verhoef et al. (2009) studied the customer experience in the retail sector context and defined it as a multifaceted concept that is comprehensive and includes the mental, psychological, social, and sensory responses of customers to the retailer. Moreover, De Keyser et al. (2015) defined customer experience as intellectual, sensitive, physical, sensory, spiritual, and social factors that characterize the consumer's indirect or direct interaction with the organization. Petre et al. (2006), concluded that consumers' online experiences expand further than the interactions with the website to influence their perceptions of service value and

quality. Mathwick et al. (2001) proposed evaluating the online experience based on two dimensions intrinsic and extrinsic values. The extrinsic aspect is instrumental in nature and concentrates on economic outcomes such as, competency and financial value (Wei et al., 2016). According to Kokkinou and Cranage (2013), the extrinsic values consist of speed, efficiency, and time savings that have been recognized as essential results of using a technology. Chatbots perform an important role in the customization of e-commerce services via direct chats or messages, which improves the online consumer experience (Chung et al., 2020; Rose et al., 2012), On the other hand, the intrinsic aspect focuses on the joy, pleasure, and amusement rather than its effects (Mortimer et al., 2016; Wei et al., 2016). Intrinsic values encompass emotions such as achievement, autonomy, assurance, originality, and pleasure, which have been identified in previous research as factors that enhance an individual's inclination to adopt technology (Meuter et al., 2005)

### **2.3 Chatbots service quality and online customer experience**

The chatbot service quality that a business provides is vital since it influences the customer experience (Trivedi, J.,2019). A positive customer experience can increase the customer's level of satisfaction, confidence, and involvement, all of which can lead to increased customer loyalty (Trivedi, J.,2019). Previous studies have investigated the different dimensions that measure the chatbot service quality, Wang and Strong (1996) introduced a theoretical outline consisting of four distinct categories of information system (IS) data quality: representational, intrinsic, contextual, and accessibility. This framework, which comprises a total of 15 sub-dimensions has served as a significant theoretical foundation for subsequent research on the quality of IS. Parasuraman et al. (1988) have put forth a five dimensions theoretical framework of service quality, namely responsiveness, tangibility, assurance, reliability and empathy. This framework has been empirically validated in the context of customer services provided

by different industries. Nelson et al. (2005) put forth a proposal consisting of nine dimensions pertaining to system and information quality and conducted an empirical study to validate the measurement of these dimensions, utilizing data collected from multiple industries.

From these previous studies the researcher has identified four quality dimensions that are considered the most important dimensions for chatbots. These dimensions include reliability, responsiveness, interactivity, and usability.

Parasuraman et al. (1988) explained that reliability is the perception that a chatbot has the ability of delivering the desired service consistently and correctly. This definition applies to chatbot services because giving users high performance and accurate information is important when employing the services provided by chatbots (Chung and Park 2019). In their study AlHagbani and Khan (2016) determined that enhancing the reliability of services offered by chatbots may lead to greater adoption of chatbots within online communities in the Arabic region. Kalia et al. (2017) found that if a relevant response is given throughout a dialogue, the reliability of chatbots can be guaranteed. Reliable chatbots could improve customer experience measured by the extrinsic and intrinsic values because it can satisfy both the accuracy and the fun and enjoyment that customers are expecting, chatbots can also improve the efficacy of work performance and encourage further growth, (Sensuse et al., 2019). Therefore, we suggest the following:

*H1: Chatbot reliability has a significant effect on extrinsic values.*

*H2: Chatbot reliability has a significant effect on intrinsic values.*

Responsiveness pertains to the user's perception of a chatbot's ability to promptly assist and provide users with efficient services (Parasuraman et al., 1988). This definition applies to chatbot services because the purpose of chatbot-enabled service agents is to provide users with services with no tardiness in their replies and reliable answers so they

can perceive chatbots as providing comparable services and responses to those offered by human customer service agents, thereby instilling a sense of confidence in their interactions with these automated systems. According to Meerschman and Verkeyn's (2019) findings, responsiveness is a crucial quality attribute of chatbots that can be utilized to guarantee their overall quality. the incorporation of responsiveness can lead to a notable enhancement in chatbot design, particularly in the development of interaction user profiles (Danilava et al.,2013). Nguyen (2019) claimed that responsiveness might substantially enhance customer service chatbot systems. According to Roy et al. (2018), the prompt response time, accessibility, and availability of chatbots have been identified as key factors that contribute to customers' sense of comfort and perceived value (Chung et al., 2020). Chatting with chatbots is also fun for customers. Fun is a notable component of the customer experience because it makes customers think digital tools are more valuable and more likely to use them (Go and Sundar, 2019). Hence, the subsequent hypotheses are built:

*H3: Chabot responsiveness has a significant effect on extrinsic values.*

*H4: Chabot responsiveness has a significant effect on intrinsic values.*

Interactivity is the users' belief that their discussions with a chatbot mimic their conversations with human agents, this perception makes the user believe that he controls what he wants when using the chatbot service. (Cho et al.,2019). Interactivity is very important in measuring a service quality because it has been found that it is crucial for systems that are used by end users to boost the engagement of users by delivering customized assistance (Neuhofer et al. 2015). It has also been proven that interactivity is a key element in developing the human element of chatbots (Go and Sundar 2019). This human element is important for customers to have a positive online experience measured by both intrinsic and extrinsic values.



*H5: Chabot interactivity has a significant effect on extrinsic values.*

*H6: Chabot interactivity has a significant effect on intrinsic values.*

In order to provide a better experience for their users, chatbots need to integrate usability, as a crucial factor in interactive software systems (Ren et al., 2019). Usability refers to a characteristic or feature that denotes the level of ease with which a human-computer interface can be utilized to achieving a specific objective with optimal effectiveness, efficiency, and overall satisfaction (Petre et al., 2006). The simplicity of use factors that enhance the user experience is one of the usability measurements as identified by Finstad (2010). Customers view companies utilizing chatbots as innovative rather than cost-cutting, owing to their capacity to originate a dialogue describing features of products and services offered online (Joyce and Kirakowski, 2015). According to Prentice et al. (2019), chatbots have the ability to offer easy guidance to customers, thereby creating a sense of achievement which can enhance both intrinsic and extrinsic values of the online customer experience. Thus, we can suggest the following:

*H7: Chabot usability has significant effect on extrinsic values*

*H8: Chabot usability has significant effect on intrinsic values*

#### **2.4 customer experience, customer satisfaction and customer advocacy**

Online customer satisfaction is described as a customer's perceived degree of enjoyment with earlier interaction with a certain online retailer (Anderson and Srinivasan ,2003). Customers today have higher expectations in the online world and because of the advances in technology they demand a high level of services (Grönroos & Voima, 2013). Organizations are therefore required to offer better services and

spend more on managing the customer experience with both its dimensions extrinsic and intrinsic values, particularly in the online environment. A pleasant customer experience increases satisfaction, confidence, desire to return, desire to repurchase, and loyalty (Verhoef et al., 2009). Besides, a strong emotional bond between a company's brand and its clients can be created through Customer experience which can also improves customer advocacy (Gentile et al., 2007). The concept of customer advocacy pertains to the level to which a customer fully endorses and provides backing for a company (Badrinarayanan and Laverie, 2013). This involves positive word-of-mouth as well as resistance to unfavorable information about the firm (Pai et al., 2013). Therefore, the following hypotheses were proposed:

*H9: Extrinsic values have a positive effect on customer satisfaction.*

*H10: Intrinsic values have a positive effect on customer satisfaction*

*H11: Customer satisfaction has a significant effect on customer advocacy*

### **3. Research Objectives**

1. To Investigate the effect of the AI chatbots quality dimensions: reliability, responsiveness, interactivity, and usability on online customer experience
2. To Examine the effect of intrinsic and extrinsic Values of online customer experience on customer satisfaction.
3. To Study the effect of customer satisfaction on customer Advocacy.

### **4. Research proposed Model**

The research model was designed based on the previous hypotheses as follows:

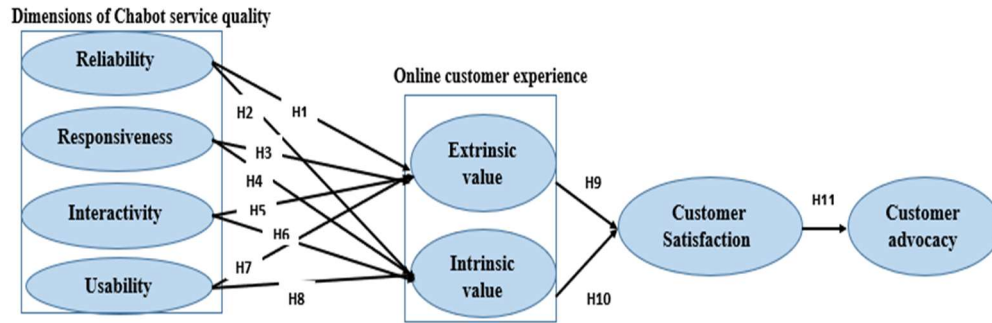


Figure 1: The proposed research Model

## 5. Study Sector and data collection

The banking industry in Egypt accounts for over 90% of the country's total financial assets. It supplements the activities of the non-banking sector, which includes the insurance industry, the postal service, the stock market, funds for investment, and other non-banking financial organizations. In spite of numerous economic and financial shocks over the past two decades (including the global economic downturn of 2007-2009, the fallout from the revolutions of 2011 and 2013, and the 2020 pandemic of COVID-19), The banking sector's ability to withstand challenges can be attributed to the implementation of the Egyptian banking restructuring system by the Central Bank of Egypt applied in 2004, as well as the adherence to the Basel Committee's banking standards. These measures have effectively improved the solvency and liquidity of the banking sector. In addition, the financial soundness indicators of the banking sector surpass the minimum regulatory standards established by both the Basel Committee and the Central Bank of Egypt. The aforementioned factor enhances the resilience of the banking industry against adverse events, thereby supporting its

function as a financial intermediary and upholding a considerable degree of banking stability (CBE, 2023).

The banking industry is experiencing the effects of rapidly emerging innovative technologies on an almost daily basis. Artificial Intelligence (AI) is currently positioned at the centre ultimately resulting in an unavoidable transformation of the banking sector.

Banking AI software has become ubiquitous in modern times, with applications ranging from complicated algorithms based on machine learning designed to combat money laundering to computerized big data processes for identifying fraud, as well as customer support chatbots, intelligent contracts, and rating systems. It is likely that individuals have already engaged with such software without being cognizant of its presence (Fintech, 2019).

Data were collected using an online survey. The population of the study consisted of customers of 5 banks in Egypt that use chatbots in providing customer services and these banks are: Banque Misr, Banque du caire, Credit Agricole, Commercial international bank and Abu Dhabi Commercial Bank - Egypt ADCB. 350 online questionnaires were sent to participants. A total of 335 complete questionnaires were collected for a response rate of 96%.

## 6. Measurement Scales

All the variables of this study were measured using scales adopted from previous studies. The various items of the instruments were assessed using a Likert scale consisting of five points, ranging from "strongly agree" to "strongly disagree". The first section of the questionnaire asked respondents to provide basic personal information such their age, gender, level of education, and current profession. Table 1 shows the variables of the study, the number of items that measure each variable and the source of each scale.

**Table 1: Measurement scales**

Variables	Items	source
Reliability	3 items	Parasuraman et al. (1988)
Responsiveness	3 items	Parasuraman et al. (1988)
Interactivity	3 items	Cho et al. (2019)
Usability	9 items	Rose et al. (2012); Finstad (2010).
Extrinsic values	6 items	Rose et al. (2012) Chung et al. (2020)
Intrinsic values	3 items	Roy et al. (2018).
Customer satisfaction	4 items	Fang et al. (2011)
Customer advocacy	3 items	Kandampully and Suhartanto (2008)

## 7. Data Analysis

### 7.1 Statistical methodology

The statistical analysis consisted of three parts: first, the descriptive statistics of all variables were measured using SPSS software V.25; second, a confirmatory factor analysis (CFA) was used to assess constructs validity, and the Cronbach's alpha coefficient was used to assess constructs' reliability; third, to achieve the objectives of the study, structural equation modeling (SEM) was conducted using AMOS software V.25.

### 7.2 The descriptive statistics

**Table 2: demographic characteristics of respondents**

		N	%
Gender	Female	161	48.1
	Male	174	51.9
	Total	335	100.0
Age	21 - 30	181	54.0

	<b>31 - 40</b>	<b>134</b>	<b>40.0</b>
	<b>&gt; 40</b>	<b>20</b>	<b>6.0</b>
	<b>Total</b>	<b>335</b>	<b>100.0</b>
<b>Education</b>	<b>undergraduate</b>	<b>100</b>	<b>29.9</b>
	<b>graduate</b>	<b>129</b>	<b>38.5</b>
	<b>Postgraduate</b>	<b>106</b>	<b>31.6</b>
	<b>Total</b>	<b>335</b>	<b>100.0</b>
<b>Occupation</b>	<b>Private sector</b>	<b>162</b>	<b>48.4</b>
	<b>Public sector</b>	<b>105</b>	<b>31.3</b>
	<b>Student</b>	<b>68</b>	<b>20.3</b>
	<b>Total</b>	<b>335</b>	<b>100.0</b>

As Shown by table 2, 51.9% of the sample were males, while 48.1% were females. The majority of the respondents (94 %) were in the age range 21–40 years, while 6% only were more than 40 years. Besides, 38.5% of the respondents were graduates. Finally, 48.4 % work in the private sector, while 31.3% work in the public sector.

**Table 3: Descriptive statistics**

Variable	Mean	Median	SD	Range	Min.	Max.
Reliability	3.9950	4.0000	.86187	4.00	1.00	5.00
Responsiveness	3.9950	4.0000	.85373	3.67	1.33	5.00
Interactivity	3.9960	4.0000	.85354	3.33	1.67	5.00
Usability	3.9970	4.0000	.84739	3.56	1.44	5.00
Extrinsic values	3.9930	4.0000	.85020	3.33	1.67	5.00
Intrinsic values	3.9950	4.0000	.84825	3.33	1.67	5.00
Customer satisfaction	3.9866	4.0000	.85330	3.25	1.75	5.00
Customer advocacy	3.9960	4.0000	.84649	3.33	1.67	5.00

As shown in table 3 the descriptive statistics for the variables showed that there is no large variation in the data because of the small values of standard deviation (less than 1), The mean and median values of all variables exhibit a high degree of proximity. Moreover, according to Medsker et al. (1994), we can consider that the sample is suitably large (335 cases) and there is no violation of the multivariate normality assumption, because the sample is greater 200 cases.

### 7.3 Measurement model

**Table 4: Validity test of the Constructs**

Construct	items	Factor loading	R-square
Reliability	Q11	.958	0.918
Reliability	Q12	.970	0.941
Reliability	Q13	.971	0.943

Responsiveness	Q21	.947	0.897
Responsiveness	Q22	.954	0.910
Responsiveness	Q23	.969	0.939
Interactivity	Q31	.946	0.895
Interactivity	Q32	.965	0.931
Interactivity	Q33	.958	0.918
Usability	Q41	.966	0.933
Usability	Q42	.958	0.918
Usability	Q43	.958	0.918
Usability	Q44	.963	0.927
Usability	Q45	.972	0.945
Usability	Q46	.958	0.918
Usability	Q47	.958	0.918
Usability	Q48	.957	0.916
Usability	Q49	.966	0.933
Extrinsic value	Q51	.955	0.912
Extrinsic value	Q52	.943	0.889
Extrinsic value	Q53	.927	0.859
Extrinsic value	Q54	.941	0.885
Extrinsic value	Q55	.950	0.903
Extrinsic value	Q56	.945	0.893
Intrinsic value	Q61	.943	0.889
Intrinsic value	Q62	.954	0.910
Intrinsic value	Q63	.930	0.865
Customer Satisfaction	Q71	.945	0.893
Customer Satisfaction	Q72	.956	0.914
Customer Satisfaction	Q73	.931	0.867
Customer Satisfaction	Q74	.954	0.910
Customer advocacy	Q81	.926	0.857
Customer advocacy	Q82	.933	0.870
Customer advocacy	Q83	.943	0.889

Table 5: Convergent validity and reliability of the Constructs



Construct	Cronbach's $\alpha$	AVE	CR
Reliability	0.977	0.929	0.983
Responsiveness	0.971	0.903	0.977
Interactivity	0.970	0.913	0.979
Usability	0.991	0.925	0.998
Extrinsic values	0.987	0.901	0.994
Intrinsic values	0.971	0.900	0.976
Customer satisfaction	0.982	0.903	0.987
Customer advocacy	0.972	0.880	0.970

Note: CR: construct reliability; AVE: average variance extracted. **Cronbach's  $\alpha$  of the two constructs is .998**

The maximum likelihood (ML) method is used to estimate the model estimates and the overall fit index of the measurement model. The CFA was used to assess the convergent and discriminant validity for the eight variables. Tables 4 and 5 present the reliability of the measurement items that was verified using Cronbach's  $\alpha$  to assess the internal consistency of the constructs in the model. The level of internal consistency for each construct was acceptable because it has exceeded the minimum hurdle of 0.50 (Hair et al., 1998). All included measurement items have standardized loading estimates higher than 0.5 (ranging from 0.926 to 0.972), indicating the convergent validity of the measurement model. Also, construct reliability (CR) was verified to estimate convergent validity; each construct had acceptable construct reliability, because all constructs exceeded the minimum criterion of 0.5 (ranging from 0.97 to 0.998) (Hair et al., 1998). Moreover, because the average variance extracted (AVE) from all constructs exceeded the

minimum criterion of 0.5 (ranging from 0.880 to 0.929), convergent validity was assured.

**Table 6: Correlation matrix and the discriminant validity**

Construct	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Reliability (1)	1	.989**	.978**	.988**	.987**	.984**	.979**	.975**
Responsiveness (2)	.989**	1	.982**	.994**	.992**	.986**	.988**	.984**
Interactivity (3)	.978**	.982**	1	.986**	.984**	.985**	.982**	.975**
Usability (4)	.988**	.994**	.986**	1	.997**	.993**	.990**	.990**
Extrinsic values (5)	.987**	.992**	.984**	.997**	1	.990**	.992**	.988**
Intrinsic values (6)	.984**	.986**	.985**	.993**	.990**	1	.990**	.983**
Customer satisfaction (7)	.979**	.988**	.982**	.990**	.992**	.990**	1	.984**
Customer advocacy (8)	.975**	.984**	.975**	.990**	.988**	.983**	.984**	1

Notes: \*\* Correlation is significant at the 0.01 level (two-tailed).

To test the discriminant validity among the constructs, we estimated the correlations among all variables to determine whether they were significantly different from 1; the confidence intervals of the correlations, did not contain 1, so these results indicated the discriminant validity of the measurement model. As shown in table 6 all measurement results are satisfactory and suggest that it is appropriate to proceed with the evaluation of the structural model.

### 7.4 Structural model

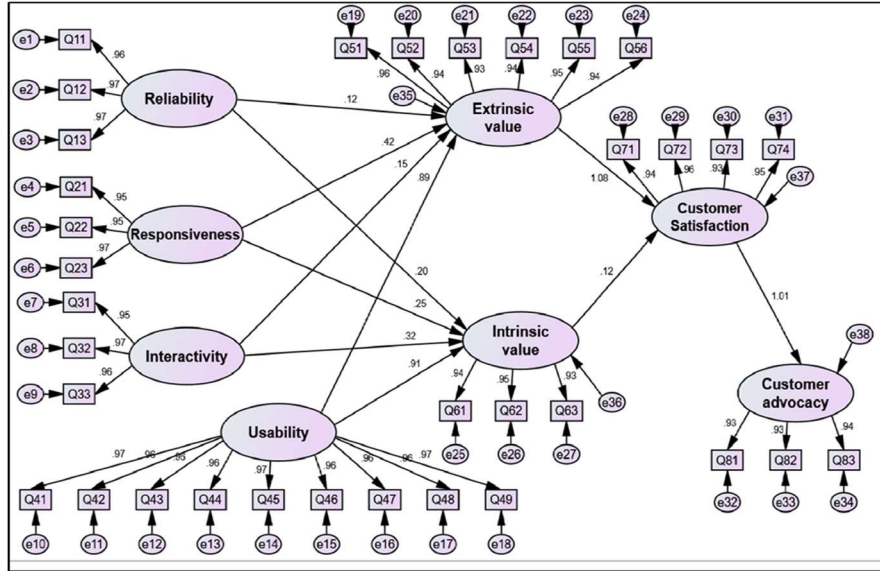


Figure 2: Standardized regression coefficients of the proposed model

Table 7: Model fit statistics of the Structural model

Index	Fit value	Cut-off value
Normed $\chi^2$ ( $\chi^2/df$ )	2.550	<3.00
Goodness of Fit Index (GFI)	.963	>0.90
Adjusted goodness of fit index (AGFI)	.952	>0.90
Normed Fit Index (NFI)	.971	>0.90
Comparative Fit Index (CFI)	.987	>0.90
Root Mean Square Error of Approximation (RMSEA)	.035	< 0.09
Root mean square residual (RMR)	.038	< 0.09

Table 7 presents the model fit indices of the structural model and the cut-off value of those fit indices. The goodness-of fit statistics show that the structural model fit the data reasonably well and the structural model was a reasonable fit. It was found that the normed chi-square statistic is 2.550, that is less than the smallest limit 3 and the Root Mean Square Error

of Approximation (RMSEA) is less than the cut off value 0.09 and the Goodness of Fit Index (GFI) and the Comparative Fit Index (CFI) are greater than the cut-off values 0.90.

Figure 2 shows the standardized path regression coefficients that indicate the direct influences of the predictor upon the predicted latent constructs for the proposed model.

**Table 8: Hypotheses Testing**

Hypothesis	Variable		Variable	Estimate	t-statistic	p-value
H1	Reliability	→	Extrinsic value	.093	15.311	***
H2	Reliability	→	Intrinsic value	.170	24.059	***
H3	Responsiveness	→	Extrinsic value	.321	32.778	***
H4	Responsiveness	→	Intrinsic value	.211	27.685	***
H5	Interactivity	→	Extrinsic value	.117	18.609	***
H6	Interactivity	→	Intrinsic value	.284	31.778	***
H7	Usability	→	Extrinsic value	.670	43.593	***
H8	Usability	→	Intrinsic value	.762	45.103	***
H9	Extrinsic value	→	Customer Satisfaction	.999	37.714	***
H10	Intrinsic value	→	Customer Satisfaction	.107	8.621	***
H11	Customer Satisfaction	→	Customer advocacy	.993	35.039	***

Notes: \*\*\*significant at the  $p < 0.001$  level (two-tailed)

Table 8 presents the results of the testing of the hypotheses. We find that all hypotheses are positive and statistically significant at the significance level of 0.001.

## 8. Discussion and Conclusion

This research is an empirical study that tested the effect of AI chatbots on customer experience, satisfaction, and advocacy. It was hypothesized based on the results of previous studies that the dimensions for chatbots service quality which include reliability, responsiveness, interactivity, and

usability have a significant effect on both dimensions of customer experience: intrinsic and extrinsic values, which in turn has a significant effect on customer satisfaction that has a significant effect on customer advocacy. The following discussion shows the main insights that underline the effect the use of chatbots on customer experience, satisfaction, and advocacy.

The findings revealed that all for chatbots service quality: reliability, responsiveness, interactivity, and usability have a significant positive effect on both dimensions of customer experience: intrinsic and extrinsic values. The results showed that chatbots reliability has a significant positive effect on intrinsic and extrinsic values of online customer experience, and this result is logic as customers especially who are using the chatbots services in the banking sector are expecting reliable answers from chatbots that can solve their financial problems, because these answers are related to money either in form of payments or collection of money, if the answers are not reliable customers could make bad financial decisions that can have a negative consequences on their lives. That's why chatbots reliability can satisfy the customers' extrinsic values that concentrate on the economic value that the customer gets from using the chatbots services. On the other hand, when customers get a reliable answer from the chatbots services and these answers help in taking a sound financial decision the intrinsic values of the online customer experience will be perceived by the customers because they will feel joyful and amused and they will find that the use of chatbots beside its usefulness in solving their financial problems it was also fun to use this new technology. These results support the results obtained by several previous studies Chung and Park (2019); Sensuse et al., (2019); Kalia et al. (2017); AlHagbani and Khan, (2016); Parasuraman et al., (1988) who have seen reliability as a n important factor in assessing service quality and that it can has an effect on the customer exoeience..

The results also showed that responsiveness of the chatbots services has a significant positive effect on intrinsic and extrinsic values of online

customer experience. Responsiveness chatbots can assist and provide rapid services to customers, this time saving services can affect the extrinsic values of customers because they are functional by nature and consist of speed, efficiency, and time saving, when the chatbots help customers solve their financial problems in the shortest possible time customers experience will be positive and this will encourage those customers to continue using chatbots as they have contacted the chatbot got an answer in a short time . Also, the intrinsic values for customers using responsive chatbots will be affected by the responsiveness of the chatbot , because they will find joy, pleasure and amusement chatting with the chatbot and they will sense the achievement when they get the needed financial services rapidly without delays, and they will have that belief that the chatbots has the ability to assist them any time and from any location and can offer speedy services that satisfies customers' needs. Hence, we can conclude that responsiveness has a significant on customer experience. This result is aligned with the results of previous studies Parasuraman et al., (1988); Meerschman and Verkeyn ,(2019); Danilava et al., (2013); Roy et al. ,(2018); Chung et al., (2020); Go and Sundar, (2019).

The findings have also revealed that interactivity of the chatbots services has a significant positive effect on intrinsic and extrinsic values of online customer experience. When customers deal with an organization, they want to communicate with a human not a machine , but chatots have changed this idea , chatbots can imitate human interaction through natural spoken language which can affect easily both dimensions of online customer experience , on the extrinsic values level customer will be get the needed services through normal interaction through natural spoken language so he will understand the chabot and he can get clarification if he doesn't understand by asking questions to the chabot, he will also feel in control while dealing with the chatbot. On the intrinsic value level customer will find chatting with chatots funny, pleasant and give the customer a sense of achievement, because things are simplified by human element that is part of the chatbot dialogue and because chatbots offer a customized help for each customer. chatbots nowadays are given a

personality and a tone of voice to enhance their interactivity with customers. This result make side with the results of previous studies. Cho et al. (2019); Neuhofer et al. (2015); Go and Sundar (2019).

The results have also exposed that usability of the chatbots services has a significant positive effect on intrinsic and extrinsic values of online customer experience. Usability is a vital element in all technologies used by customers. If the customers find technology difficult to be used this will discourage them from reusing it or they will feel depression or out of date because they cannot use technology. The more technology is easy to use, the more customers are encouraged to use it, and the more this positively affects the customer experience with its dual dimensions. The chatbot services usability has the ability to offer customers a positive experience that can help customers in accepting and promoting technology to other customer. Also, the ease of use of the chatbot technology make the customers feel confident and up to date and able to get the needed service without the help of others. This result is supported by results of previous studies Ren et al. (2019); Petre et al. (2006); Finstad (2010); Joyce and Kirakowski (2015); Prentice et al. (2019).

Finally, the results have proved that intrinsic and extrinsic values of online customer experience have a significant positive effect on customer satisfaction and that customer satisfaction has a significant positive effect on customer advocacy. This result is logic because taking a sound accurate service (extrinsic values) plus having fun and feeling confident (intrinsic values) is the optimum solution for any customer that can lead to customer satisfaction. That is the reason we conclude that customer satisfaction is affected by the customer experience. The more positive is the customer experience with the chatbot service the more is that customer satisfaction about the service and the bank offering the service. A joyful, pleasant customer experience can create an emotional bond between the customer and the service. It can enhance not only satisfaction but also the customer desire to reuse the baking service. Besides, when customers are satisfied, they become the organization advocate. So, if they are satisfied with the

chatbot service offered they will endorse the service and the bank that offer that service to others, and they will be willing to defend the bank and to stand for any negative information about it. This result supported the results of previous studies Anderson and Srinivasan (2003); Grönroos & Voima (2013); Verhoef et al. (2009); Gentile, Milano, Noci, & Milano (2007).

This study has shed light on the importance of using technology, especially related to artificial intelligence, in the banking sector. And the role of this technology in creating a positive experience for customers.

This positive experience that helps in reaching customer satisfaction, which enables organizations to reach customer advocacy and makes these customers advocates for the brand and the organization and its defenders in the face of competitive conditions.

## **9. Theoretical and Managerial implications**

This study provides valuable theoretical and practical insights and implications. First, To the best of our knowledge, this study is one of the first studies that has chosen the banking sector in Egypt to study the effect of AI chatbots on customer experience, satisfaction, and advocacy. Egypt's banking industry is an important sector to which the government attaches considerable importance, especially with the implementation of many modern systems such as financial inclusion which aims to increase the availability of necessary and reasonably priced financial goods and services for both individuals and enterprises. This requires increasing customer attraction to financial services. So, based on the results of this study the use of AI technology in financial services is an important factor that gives customers a positive experience, which affects customer satisfaction and customer advocacy and attract customers to use those services. Second, the study has added to the literature by studying the dual dimensions of the online customer experience how they can lead to customer satisfaction and customer advocacy.

Along with those important theoretical implications, the study is very important for managers and chatbots service provider. Chatbots have



several types and designs, managers have to be very cautious while choosing the type and design of the chatbot that will provide services to their customers, they have to choose the type and design of chatbots that can facilitate the lives of their customers as these chatbots must be reliable, responsive, interactive and easy to be used by customers. Also, managers need to take into consideration the importance of giving customers a positive experience with the use of AI chatbots, which will guarantee the extended use of these services needed for the new era development. Finally, managers have to believe in the importance of customer experience and customer satisfaction and their role in retaining customers. Finally, AI Chatbots service providers and the government need to increase the awareness of customers about services offered by chatbots, through extended campaigns that inform the Egyptian customers about how to use these services and the benefit that they can get from using them. AI chatbots services are important for the organizations as they are for customers because they are cost effective services, and at the same time make the customers perceive the innovativeness of the organization.

## 10. Limitations and future research

This study has several limitations that can be covered by future research. First, this study was applied in the banking sector in Egypt. Therefore, the results were constrained solely to this sector. It is recommended that future research could potentially explore additional sectors in Egypt. Second, this study has focused on only four dimensions of the chatbots service quality. So, it is advisable for future research to include more service quality dimensions such as empathy, assurance and understandability. Finally, this study has examined the effect of chatbots on customer experience, satisfaction and advocacy. Hence it is recommended to study the effect of chatbots on other variables such as: customer trust, brand image and purchase intention.

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